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A COMPARISON OF POLYGRAPHIC AND ACTIGRAPHIC MONITORING OF SLEEP  
USING A 5-CHANNEL PROGRAMMABLE-SENSITIVITY ACTIGRAF

ANNUAL REPORT

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NOVEMBER 26, 1991

Supported by

U.S. ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND  
Fort Detrick, Frederick, Maryland 21702-5012

MIPR 91MM1505

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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE November 26, 1991	3. REPORT TYPE AND DATES COVERED Annual 15 Nov 90 - 14 Nov 91	
4. TITLE AND SUBTITLE A Comparison of Polygraphic and Actigraphic Monitoring of Sleep Using a 5-Channel Programmable-Sensitivity Actigraf			5. FUNDING NUMBERS MIPR 91MM1505  63002A 3M263002D995 BG  DA335688	
6. AUTHOR(S) Timothy F. Elsmore Paul Naitoh				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Health Research Center P.O. Box 85122 San Diego, California 92138-9174			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research & Development Command Fort Detrick Frederick, Maryland 21702-5012			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT  Approved for public release; distribution unlimited			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words)				
14. SUBJECT TERMS  Military performance; Actigraf; Sleep cycle; RA 5			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT  Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE  Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT  Unclassified	20. LIMITATION OF ABSTRACT  Unlimited	

## ANNUAL REPORT

1. MIPR No.: 91MM1505                      2. Report date: 26 Nov 91
3. Reporting period: 15 Nov 90 to 14 Nov 91
4. P.I.: Timothy F. Elsmore    5. Telephone No.: (619) 532-6174
6. Agency: Naval Health Research Center

7. Project title: A comparison of polygraphic and actigraphic monitoring of sleep using a 5-channel programmable-sensitivity actigraph

8. Current Staff, with percent effort:

Timothy F. Elsmore (25%)  
Paul Naitoh (5%)

9. Approximate expenditures to date:

Personnel	OK	Supplies	0.5k
Travel	1.5K	Other	OK
Equipment	30K	Contracts	15K (student)

10. Comments on administrative and logistical matters: All necessary equipment for this study has been ordered and delivered. However, Precision Control Designs, the company that manufacture the model AMA-32 actigraph, has indicated that the units shipped are not fully functional. They will not as yet permit programmed changes in amplifier settings, and must be programmed off-line to record activity data using a single set of parameters. They have indicated that our units will be upgraded to a fully functional state as soon as possible. As of the end of the fiscal year, no upgrades have been announced.

11. Scientific progress: Initial studies with the AMA-32 actigraph have begun. Continuous recordings have been made in a sleep deprivation study in which subjects are allowed to nap for one hour after approximately 40 hours of continuous wakefulness. In these studies, the actigraphs' sensitivity was set to mimic the older AMA-16 actigraph. Comparisons of activity measurements and polygraph sleep records during the naps is beginning. A program permitting graphical output of the activity records, as well as a crude filter for discriminating sleep from non-sleep based on the activity data has been developed. Additional software development for analysis of the AMA-32 actigraph records is in progress. Progress on this project has been slowed due to both to a lack of subjects and to requirements to devote the resources of the sleep lab to other ongoing studies in which actigraphs may not be used.

12. Plans for the next quarter: Actigraph recording will be expanded to full-night recording at each of several different

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levels of sensitivity by using multiple actigraphs on each subject. A range of algorithms for correlating the activity records with polygraph records will be explored. This will permit evaluation of the AMA-32's utility in evaluation of sleep quantity and quality.

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Unannounced ☐

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